MAUSEN

INSTRUMENTS OF THE MODERN SYMPHONY ORCHESTRA AND BAND

ARTHUR EDWARD JOHNSTONE

Revised and Augmented Edition
by
DR. EDWIN J. STRINGHAM
Teachers' College, Columbia University

CARL FISCHER INC
NEW YORK
Boston
252 Tremont Street
MUSIC
Cooper Square
Chicago
306 S. Wabash Ave.

0664

Madison Brown
Mr. S filed
Form 1#

Digitized by the Internet Archive
in 2023 with funding from
Kahle/Austin Foundation

https://archive.org/details/instrumentsofmod0000arth

Copyright, 1917 by
Carl Fischer, Inc., New York

Copyright, 1928 by
Carl Fischer, Inc., New York

Copyright, 1930 by
Carl Fischer, Inc., New York

International Copyright Secured

INSTRUMENTS
of the
MODERN SYMPHONY
ORCHESTRA
and
BAND

A PICTORIAL AND EXPLANATORY GUIDE FOR MUSIC LOVERS

BY

ARTHUR EDWARD JOHNSTONE

Revised and Augmented Edition

by

DR. EDWIN J. STRINGHAM

Teachers' College, Columbia University

Price .50

CARL FISCHER INC.

NEW YORK

Boston
352 Tremont Street

MUSIC

Cooper Square

Chicago
306 S. Wabash Ave.

CONTENTS

ORCHESTRAL INSTRUMENTS

Page

Preface and Foreword on the Orchestra 6

STRINGED INSTRUMENTS (Bowed)

Violin 8
Viola 10
Viola d'Amore 12
Violoncello 14
Double Bass 16

STRINGED INSTRUMENTS (PLUCKED)

Mandolin 18
Guitar 20
Banjo 22
Zither 24
Harp 26

WOOD-WIND AND REED INSTRUMENTS*

Flute (C) 28
Piccolo (C) 30
Oboe 32
Oboe d'Amore 32
English Horn 34
Heckelphone 36
Clarinet 38
Basset-Horn 40
Bass-Clarinet 42
Bassoon 44
Double Bassoon 46
Saxophone 48
Piano-Accordion 93

BRASS INSTRUMENTS

French Horn 50
Trumpet 52
Cornet 54
Trombone 56
Tuba 58

*All Wood-wind, Reed, Brass and Percussion Instruments used in the Orchestra will be found in the Band, though in some instances in different pitch or model especially adapted for Band use, as shown in Special Band Instruments following.

PERCUSSION INSTRUMENTS

Page

Celesta 60
Dulcimer (or Cimbalom) 62
Kettle Drums (Timpani) 64
Bass Drum 66
Snare Drum 66
Chimes 68
Cymbals 68
Gong 70
Triangle 70
Glockenspiel 72
Xylophone (Also Vibraphone) 72
Castanets 74
Tambourine 74

NEW ELECTRICAL INSTRUMENTS

Victor Theremin 76

BAND INSTRUMENTS

Foreword on the Band 78
Pitch of Band Instruments 79
Instruments Used in Bands 80

(Special Band Types of Instruments already mentioned, and Instruments used only in Bands are listed below.)

D flat Piccolo 81
D flat Flute 81
B flat Fife 81
E flat Clarinet (high) 82
E flat Alto Clarinet 82
Saxophones 82
E flat Horn 82

INSTRUMENTS USED ONLY IN BANDS

E flat Contra Bass Saxophone 83
E flat Contra Bass Sarrusophone 84
B flat Fluegelhorn 86
G, F and B flat Bugles 86
E flat Alto, Mellophone (or Concert Horn) 88
Baritone or Euphonium 89
Tenor Horn 89
B flat Bass 89
Valve Trombone 90
E flat Bass (Tuba) 90
BB flat (Contra) Bass (Tuba) 90
Helicon, Sousaphone (Tuba or Bass) 91

SPECIAL BAND PERCUSSION INSTRUMENTS

Marimbaphone or Xylorimba 92
Lyre (Glockenspiel) 92

PREFACE

IN view of the rapidly increasing number of Symphony Orchestras and Bands throughout the country, and the consequent wide-spread interest in the better class of orchestral and band music, a demand has arisen among music-lovers and students for information concerning the instruments that constitute the modern symphony orchestra and band. The purpose of this little book is to supply such information as is really needful to the intelligent concert-goer. It is designed to occupy a middle place between the profound technical treatise on the one hand and the insignificant handbook on the other. Its scope covers briefly the construction, tonal qualities, range, and special uses of each instrument, not in its solo capacity, but rather as part of the orchestral or band ensemble.

¶ Through the courtesy and co-operation of artist members of the New York Philharmonic Society, the Metropolitan Opera House Orchestra and the Goldman Band it has been possible to illustrate not only the proper manner of holding the various instruments, but also to give a correct idea of their relative sizes—impossible when instruments alone are depicted.

FOREWORD ON THE ORCHESTRA

¶ A few words concerning the orchestra as a musical unit may prove of interest. The orchestra as a whole may be regarded as a single, great instrument possessing almost limitless musical possibilities. When one considers that each individual member of an important orchestral organization is an artist who devotes his life to an instrument which, like the human voice, is capable of producing but one tone at a time (double-stopping on the strings need not here be considered), it is not surprising that the results obtained by the intelligent co-operation of seventy-five to a hundred such artists under masterful leadership easily transcend the efforts of the greatest pianist or organist, who is called upon to render with ten fingers *all* the harmonies and simultaneous melodies which may occur in a piece of music.

¶ Not only is the orchestra capable of rendering at one time a multiplicity of independent themes, but by virtue of the many different tone colors which characterize the various instruments, the melodic line traced by each individual voice may be easily followed by the attentive ear, while all the voices blend in one harmonious whole. It is this complete independence of each voice in respect to power, tonal quality, and style of phrasing which makes the orchestra unapproachable as a means of musical expression.

¶ Many volumes have been written concerning the varying excellence of instruments of the string family, but it does not seem to have been recognized that both woodwind and brass instruments vary greatly in quality of tone, accuracy of intonation, ease of blowing, and perfection of mechanism—all of which depend upon the skill of the makers. Moreover, each individual instrument, be it flute, oboe, bassoon, horn, trombone, or what not, has its own faults and its merits.

¶ Of the wind instruments it has often been said that the slide trombone excels all others in accuracy of intonation, and in this respect is unique in being the equal of the stringed instruments. This statement must not be taken too literally. An artist possessing a fine instrument—be it woodwind or brass with valves—can play perfectly in tune by delicate regulation of lip tension and manner of blowing. Thus **all** good instruments are susceptible of being played in tune if the player is skilled and his ear is perfect.

¶ In giving the range of the different instruments, it has not been possible to indicate a precise upper limit. The trend of modern orchestration is to extend the upward range of all instruments. This is no doubt due to constantly increasing efficiency on the part of orchestral players. Nevertheless, the skillful orchestrator refrains from imposing needless difficulties on his performers. Simple, idiomatic scoring is likely to yield more beautiful results because the player is free to concern himself with shading and phrasing and is not distracted by uncomfortably high notes or inconveniently devised passages.

¶ It is worthy of note that no absolute novelties in orchestral instruments have been invented for several hundred years. Combinations of previously existing types have been devised, such as the Saxophone. There have also been many improvements in mechanism, such as the Boehm flute; valves have been added to horns and trumpets—greatly to their advantage, but despite the inventive genius which has been directed toward the subject of orchestral instruments, no essentially new form of tone-producing device has been involved. Perhaps the reason for this is not far to seek. The instruments of the orchestra of even Mozart's day afford such a variety of colors that may be exploited separately or in infinite combination, that, under the hands of a master of orchestration, the wealth is so great as to leave practically nothing to be desired.*

---

* As a possible new instrument, see the Victor-Theremin described on page Seventy-Six.

ORCHESTRAL INSTRUMENTS

STRINGED INSTRUMENTS (Bowed)

VIOLIN

ITALIAN	*GERMAN*	*FRENCH*
VIOLINO	VIOLINE GEIGE	VIOLON

The Violin is the leading instrument of the orchestra. It owes its preëminence to the fact that while its tone-quality is sufficiently indefinite to admit of its use for long periods without palling, it is also capable of expressing the widest possible range of emotions.

The four strings have been ordinarily made of sheep-gut. The lowest of these—the G String—is overspun with wire, either pure silver or silver-plated copper. The Steel E String is now extensively used. Aluminum D and A Strings (overspun) are becoming popular.

Plucking the strings is known as Pizzicato Playing.

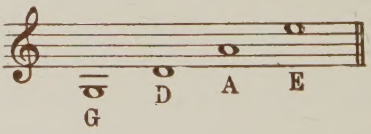
The Bow is strung with a fine quality of white horsehair.

Throughout its entire range of over four octaves the most rapid passages may be executed with all degrees of power, from the faintest whisper to the most brilliant fortissimo.

In symphony or grand opera orchestras there are likely to be about thirty violins in all, grouped in the proportion of sixteen first and fourteen second violins.

The range of the violin with all chromatic intervals is:

The four strings are tuned in fifths, thus:



The Mute (Sordine) placed on the bridge subdues the vibrations and creates a mournful, mysterious effect.

VIOLA*

ITALIAN	*GERMAN*	*FRENCH*
VIOLA	BRATSCHE	VIOLE

In appearance and in the manner of holding and playing, the Viola is essentially the same as the Violin. It is, however, a trifle larger, and its longer, heavier strings are tuned a fifth lower than those of the Violin. The lowest two—the C and the G—are wire-spun.

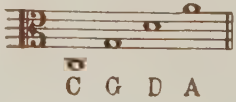
The use of the Viola as a solo instrument is rather rare, but its *timbre* (tone quality), veiled and somewhat nasal, is admirably adapted to the rendition of strains where a certain quality of sadness prevails, and where the more open and brilliant tone of the violin would be far less appropriate.

In large orchestras about three-quarters as many Violas as Second Violins are employed. They are most frequently used as harmony instruments, either alone or in combination with the Second Violins.

Viola parts are written in the alto clef—middle C on the third line. This clef is best suited to the compass of the instrument, leger lines being seldom required. For very high passages the treble clef is employed.

The pizzicato is used exactly as with the Violin; also the mute, which is a trifle larger.

The Viola is tuned:



The range of the Viola with all chromatic intervals is:

*In England the Viola is sometimes called the Tenor, Tenor Violin or Alto.

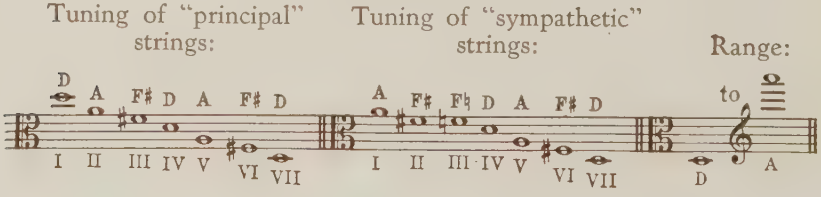
VIOLA D'AMORE

ITALIAN	*GERMAN*	*FRENCH*
VIOLA d'AMORE	LIEBESGEIGE	VIOLE d'AMOUR

During the 17th and 18th centuries, this instrument was in general use throughout Europe. From then until our own time, it fell into disuse, its place being taken by the more sonorous and slightly smaller regular viola (which see). Some of the modern composers are attempting to revive it; one of the most successful of these is our own composer, Ch. M. Loeffler, who uses it to such great effect in his "La Mort de Tintagiles." One of the outstanding Viola d'Amore players of the day, Paul Shirley, in his text "The Study of the Viola d'Amore,"* cites the following obbligati uses of the instrument in operatic and orchestral works: "Kuhreigen" by d'Albert, "Louise" by Charpentier, "Le Jongleur de Notre-Dame" by Massenet, "Les Huguenots" by Meyerbeer, "Madame Butterfly" by Puccini, "Intermezzo Goldoniani" by Bossi, "Dances of the Pyrenees" by Heckscher, and "La Mort de Tintagiles" by Loeffler.

The distinguishing characteristic of the construction of the instrument is the employment of seven "principal" strings tuned as shown below, and seven fine steel wire "sympathetic" strings placed just above the belly and immediately below the finger-board, and running the entire length of the instrument. The tuning of these sympathetic strings vary (Paul Shirley gives the tuning shown at the close of this description).

The tone quality of the Viola d'Amore is of "melting sweetness" and especially suited to "cantilena" passages. The higher register is excellent, even to the point of brilliancy—though it is never at home in any display of pyrotechnical skill. "It sings a melancholy and very appealing song," says a lover of the instrument.


Tuning of "principal" strings:
Tuning of "sympathetic" strings:
Range:
D A F♯ D A F♯ D
I II III IV V VI VII
A F♯ F♮ D A F♯ D
I II III IV V VI VII
to
D A

*Published by Carl Fischer, Inc., New York.

VIOLONCELLO*

(CELLO)

ITALIAN	*GERMAN*	*FRENCH*
VIOLONCELLO	VIOLONCELL	VIOLONCELLE

Although the principal use of the Cello in the orchestra is to supply the bass part of the harmony—with the Double-Bass usually an octave below—its full, rich, penetrating tone, combined with an unusually large range, renders the Cello one of the most frequently used voices in solo passages. It is equally telling in the bass, tenor, and soprano registers.

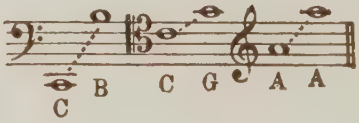
It is tuned in fifths, one octave below the Viola, and its lowest two strings, the C and the G, are wire-spun. In Symphony and Grand Opera Orchestras the number of Cellos is likely to be slightly more than half that of the First Violins.

All the effects in bowing, pizzicato, use of the mute, etc., may be advantageously employed on the Cello.

Cello parts are usually written in the bass clef, but the tenor clef—middle C on the fourth line—is frequently employed where the parts run rather high. For the highest solo passages the treble clef (the G clef of the Violin, Piano, etc.), is used.

The Cello is tuned:

The range of the Cello with all chromatic intervals is:



*This instrument is frequently miscalled the "Violincello." Its derivation (Italian) is "Violone"—Double-Bass; "Cello"—small.

CARL FISCHER

DOUBLE BASS

(BASS)

ITALIAN	*GERMAN*	*FRENCH*
CONTRABASSO	KONTRABASS	CONTRE-BASSE
VIOLONE		VIOLONAR

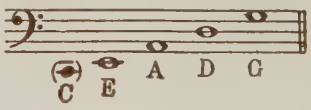
To this instrument are assigned normally the deepest bass parts of the score. Basses are mounted with three, four, or five strings. The four string variety is most widely used, having almost completely supplanted the three-string instruments. In modern symphony orchestras the five-string Bass is making rapid headway, its special advantage being the downward extension of its compass to low (16 foot) C—one octave below the C string of the Cello.

As tuning in fifths would be impracticable on this large instrument, a series of fourths is employed in order that scale and passage work may lie more conveniently under the hand. Usually there are two less Basses than Cellos in Symphony and Grand Opera Orchestras.

Parts for the Double Bass are written an octave above their actual sound in order to avoid the constant use of leger lines below the staff. The Bass is thus one of the so-called "Transposing Instruments" whose pitch differs from its staff representation.

The two lowest strings are wire-spun. The bow is short and sufficiently sturdy to suit the requirements of the heavy strings. The pizzicato is very effective and the use of the mute is by no means uncommon.

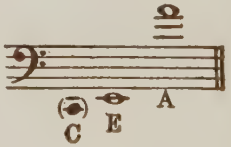
The Four-String Bass is tuned:
(The black note shows the tuning for the extra string on the Five-String Bass.)



(Sounds an octave lower.)

The range of the Bass with all chromatic intervals is:

(Notes below E (down to C) are available only on the Five-String Instrument.)



All notes sound an octave lower.

The Double Bass is also used in Concert Bands.

MANDOLIN

ITALIAN MANDOLINO

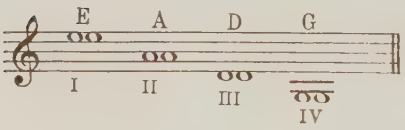
GERMAN MANDOLINE

FRENCH MANDOLINE

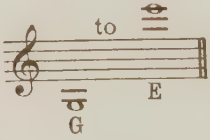
The Mandolin is a small pear-shaped instrument descending from the old lute family, with which the medieval serenaders sang their songs. It has eight wire strings, tuned in pairs, pitched the same as the violin (which see), and played with a tortoise shell "plectrum" which is held in the fingers of the right hand and passed rapidly back and forth on the strings.

In the strict sense of the word, the Mandolin is not a symphony orchestra or band instrument; but in as much as it has appeared in several such scores, it is included here. Usually the instrument is used for "local color" effect, such as in Mozart's "Don Giovanni," Gretry's "L'amant jaloux," and Verdi's "Otello." One of the most effective uses of this instrument in purely symphonic music, is in Respighi's "Roman Festivals" where it is used to portray the Neopolitan singers and to bring about a feeling of the Italian locale—a most charming effect!

The tuning is as follows:



The range:



GUITAR

ITALIAN CHITARRA | *GERMAN* GUITARRE | *FRENCH* GUITARE

Like the Mandolin, this is not a regular orchestral or band instrument, but it is included in these pages because it has been used a number of times in operatic and symphonic scores—for "local color" effects. Its shape (a Spanish Guitar) can be clearly seen in the picture on the opposite page. In pitch, the Guitar stands between the Viola and the Cello and it has six strings (see below), of which the three highest are gut and the three lowest are metal covered gut. The tone of the instrument is very much like that of the old lutes and in certain European countries is is considered the accompaniment instrument, *par excellence*, for the voice. Recently a Spanish guitarist was heard in American concert halls, playing works by Bach and other classical and modern composers with a facility and effectiveness that not only astonished the hearers with its technical display; but also fascinated them with its tonal beauty.

Berlioz loved the instrument (in reality it was his individual instrument) and he used it most tellingly in a few of his schores. Rossini used it for local color in "Il barbiere," Weber in "Oberon," and so on. One of the most expert contemporary composers in the employment of this instrument in symphonic music is Percy Grainger, especially in his Ballad, "Father and Daughter" which had an orchestra of forty Guitars and Mandolins at its first hearing, besides, of course, the other instruments of the orchestra!

The two principal types of Guitars are the Spanish and the Hawaiian (Steel) Guitars. More often than not, the Steel Guitar is tuned, E. A. E, A, C♯, E, with the first two strings written below middle C.

The tuning of the Spanish Guitar is most capricious. The following is a popular choice: (The actual sound is an octave lower than the printed note).

The range is:

Banjo

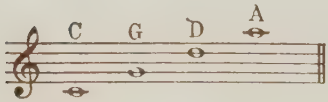
The Banjo is generally considered a native American Negro instrument, although Carl Engel (in his book, "Musical Instruments") traces it back to the negroes of Western Africa, to the Senegambian 'bania', and from there to the migrating and trading Arabs. However that may be, the world at large accepts the Banjo as an American Negro product.

The Banjo consists of a long neck (usually fretted), at one end of which are placed the tuning pegs and the other fastened to a heavy wooden or metal rim over which is tightly stretched a membrane (drum-head). The number of strings on a Banjo vary considerably, from four to seven (rare). The usual number today, as shown in the picture on the opposite page, is four.

More often than not, the Banjo is used like a percussion instrument, in which capacity it provides a rather unobtrusive, yet unmistakable, drum-like, rhythmic background. This is especially true in jazz and dance orchestras—where the instrument is quite "at home." Its use in symphonic music is rare; but when it does appear, such as in Percy Grainger's colorful scores, or as in the recent jazz opera "Jonny Spielt Auf," by Krenek, it is used to provide "local color"—quite like the uses of the mandolin and guitar. With the increase of so-called "symphonic jazz" composition, it is reasonable to suppose that the use of the Banjo will also increase.

Many different kinds of Banjos, with individual tunings, have evolved since the original Negro instrument. Among such types, are: Tenor Banjo, Plectrum Banjo with four strings, Guitar-Banjo with six strings, Banjo-Ukulele, Banjo-Mandolin, the Five Stringed Banjo and a Six Stringed Banjo. The written notation of all the Banjos is an octave higher than the actual sound.

The picture on the opposite page is of a Tenor Banjo; the Piccolo Banjo, a much smaller instrument, sounds an octave higher than the Tenor. The four strings of the Tenor Banjo are usually tuned as follows:



(Sounding an octave lower.)

ZITHER

ITALIAN	*GERMAN*	*FRENCH*
CITHARE	SCHLAGZITHER	CYTHARE

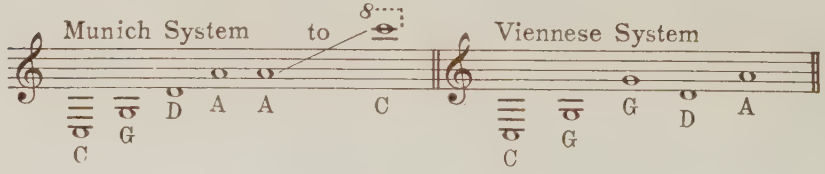
Anyone who has heard the Zither solo in that melodious Strauss Waltz, "Tales from the Vienna Woods," cannot forget the charming effect it produces: like a breeze from Old Vienna itself. Although the Zither has undergone many alterations to arrive at the appearance we now know, it has come from a very ancient lineage—way back to Egyptian times, perhaps farther back than that.

The modern Zither consists of 32 strings, of which only four are fretted and used for playing melodic parts, and the remainder to provide the accompaniment, single tones or chords, as the case may be. A ring-plectrum is used on the right thumb to play the melody, and the bare index, third and fourth fingers of the same hand pick the accompaniment strings. The left hand is occupied with fretting the melody strings.

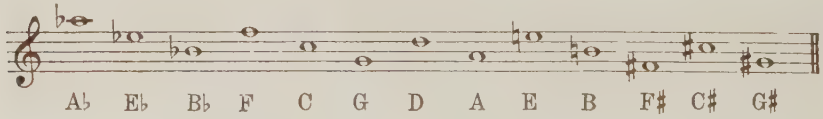
The strings are strung across the top of a flat sound-box with a round sounding-hole. Pegs at the top of the instrument enable the player to tune the strings. There are several types of Zithers. The Bass Zither tuned a fourth lower than the one given below; the Bow Zither of four strings (melody) tuned like a viola, and the concert, or prime, Zither.

The following describes the Concert Zither.

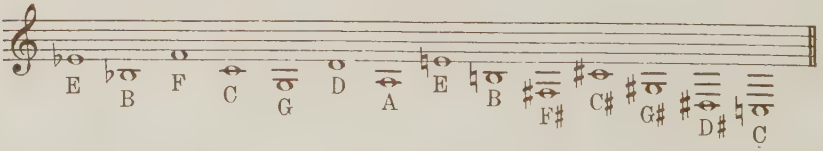
Fretted (melody) strings and range:



Accompaniment strings (sounding on octave lower):



Bass strings (sounding an octave lower):



HARP

ITALIAN	*GERMAN*	*FRENCH*
ARPA	HARFE	HARPE

Although of great antiquity, the Harp has only recently attracted the attention of serious musicians. It was originally only a diatonic instrument and modulation out of the key was not possible. Its adoption as an art instrument dates from the year 1810, when Sebastian Erard invented the Double-Action Harp, the mechanism of which has hardly been improved to this day. In fact, it may be said that Erard left this instrument as complete as the Italian Luthiers left the violin.

The Harp is tuned to the scale of C flat major, but by the use of the seven pedals, each scale tone may be raised one or two semitones, depending upon whether the pedal is depressed one or two of the notches provided. Thus it is possible to play in all keys, though the instrument remains essentially a diatonic one, chromatics being available only at moderate tempo and under conditions which must be studied before attempting to write for the instrument.

The strings are of gut, those of the lower register spun with metal wire. To assist the eye all the C's are colored red and the F's blue. The notation of Harp parts is the same as that of the piano. Although the Harp is hardly a regular member of the orchestral family, one or more Harps are frequently called for in modern scores. Their brilliant, scintillating effect is too well known to require description. Harmonics are possible and are of ethereal beauty in soft passages.

The range of the Harp is:

The Harp is often found in large concert bands.

NOTE

All Woodwind, Brass and Percussion Instruments Mentioned in Connection with the Orchestra on Pages Following are also used in Modern Bands. Other Band Instruments will be Described in Special Band Section.

FLUTE

ITALIAN	*GERMAN*	*FRENCH*
FLAUTO	FLÖTE	FLÛTE

The Flute and the Piccolo are the only wood-wind instruments played without a reed, the performer blowing across a hole in the side instead of into the end of the tube. As in all other wood-wind instruments, differences in pitch are obtained by opening and closing the finger-holes and keys.

The Flute is usually made of wood, though metal flutes, provided with various and elaborate key systems, are by no means uncommon. The most perfect modern type is known as the Boehm Flute, named after Theobald Boehm, who, in 1832, modified and greatly improved its construction and intonation. Boehm Flutes are made of wood or of silver—either solid or plated.

The Flute is the most agile of all the wind instruments, and with the exception of the Piccolo, the highest in pitch. It is equally effective in staccato and legato passages. Repeated notes may be rapidly executed by "double-tonguing."

The sombe, low notes are very characteristic, but are useful only in solos or in soft combinations. The medium register is sweet and liquid; the highest notes, brilliant and piercing.

Symphony Orchestras usually require three Flute players, the third of whom is provided also with a Piccolo, to be used when required by the score.

The range of the Flute is:

The Alto Flute in F sounds a fifth lower than written.

The D Flat Flute is mentioned in the Band Section.

PICCOLO

ITALIAN	*GERMAN*	*FRENCH*
FLAUTO PICCOLO OTTAVINO	KLEINE FLÖTE	PETITE FLÛTE

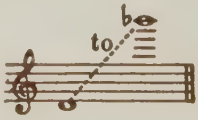
The Piccolo Flute (Italian "Piccolo" small) or Piccolo is slightly less than half the size of the ordinary Flute. Its technic is the same, but its range, an octave above that of the Flute, is also slightly restricted at both ends of its compass, the lowest note being D and the highest useful note B flat.

The first octave is weak and of little effect, its tones being better replaced by the second octave of the Flute. The second octave of the Piccolo is useful for imparting brilliancy in fortissimo passages, or it may be used for extending the upward range of the wood-wind, either forte or piano, by continuing a passage when it passes above the compass of the Flute. The highest notes are shrill and piercing; they are excellent for tearing, whistling effects in music of a stormy or terrifying character.

The use of the Piccolo in the orchestra is incidental rather than normal when three Flutes are employed, the third, or the second and third players, take the Piccolo part or parts where indicated in the score.

Parts for the Piccolo are written an octave below their actual sound in order to avoid the constant use of leger lines above the staff. It is therefore a "transposing instrument."

The range of the Piccolo is:
(Sounds an octave higher)



OBOE

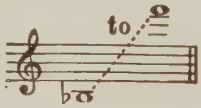
ITALIAN OBOE | *GERMAN* HOBOE | *FRENCH* HAUTBOIS

The Oboe is a reed instrument of conical bore terminating in a small flaring bell. It is played with a double reed consisting of two blades of very thin cane bound together in such a manner as to leave a small opening through which the air is blown into the instrument. The vibration of this reed sets the column of air in motion, thus producing the tone, the pitch of which is controlled by opening and closing the finger-holes and keys.

The characteristic tonal quality of the Oboe is reedy and somewhat nasal. Its lowest tones are loud and strident, and must be used with the utmost discretion. The highest tones are difficult of production and are of doubtful utility, the Flute taking these pitches more effectively. It is in the medium register, comprising about an octave and a half, that the Oboe excels in charm and flexibility. Its voice is pastoral, tender, and not without a touch of sadness, but it may also express joyous and graceful phrases with excellent effect.

The Oboe is the most assertive of the wood-wind instruments, owing to its incisive tonal quality. Two, and often three Oboes are employed in Symphony Orchestras, the third performer being also provided with an English Horn to be used when required by the score.

The range of the Oboe is:



OBOE D'AMORE

FRENCH
HAUTBOIS d'AMOUR

This instrument is pitched a minor third below the Oboe, and could justly be called an Oboe in A. . . . Its tone is more tranquil and serene than that of the Oboe, especially in its lower four tones. . . . Johann S. Bach used it quite frequently and within recent years Richard Strauss scored for it in his "Sinfonio Domestica." . . . As this instrument in its technical make-up is the same as the Oboe (only with a shorter compass) it is advisable to use it as a transposing instrument and write its part in A. Range and notation is as follows:

2009 - Very few worldwide makers left.
Cost $12,000 each.

English Horn

ITALIAN	*GERMAN*	*FRENCH*
CORNO INGLESE	ENGLISCHES HORN	COR ANGLAIS

The name of this instrument is misleading, as it is neither English nor a horn, but simply an enlarged or Alto Oboe, fingered and blown the same as the ordinary Oboe. It has the same range (thirty-two notes), but is pitched a fifth lower. The two or three highest notes are seldom used, as they are difficult of production and of inferior quality to notes of the same pitch taken on the Oboe.

Its tonal quality lacks the artless gayety and sprightliness obtainable on the Oboe. It is nobler, richer, and somewhat veiled. It blends admirably with all the other instruments of the wood-wind group, even its lowest tones being available in soft combinations without fear of cutting through the tonal mass.

The English Horn, in reality, is a transposing instrument in F, though not so designated in the score. It speaks a fifth lower than its notation, so that, for instance, the sounding scale of C would require the notation of the scale of G. Hence it follows that the English Horn calls for one more sharp (or one less flat) in its signatures than do Violins, Violas, Flutes, and other instruments pitched in C. The English Horn part is usually played by the third oboist.

The range of the English Horn is:

HECKELPHONE

ITALIAN HECKELPHONE | *GERMAN* HECKELPHON | *FRENCH* HECKELPHONE

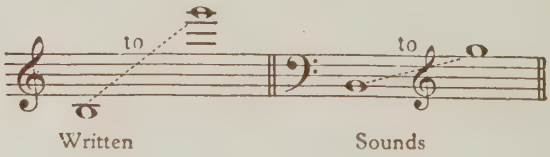
The Heckelphone is an instrument of comparatively modern origin (about 1905) and is named for its inventor Wilhelm Heckel, a well known maker of wood-wind instruments at Biebrich on the Rhine (near Wiesbaden).

It is of conical bore, is played with a double reed and belongs to the oboe family. In appearance it is a very much enlarged Oboe, being so long that the bell rests upon the floor when the player is seated. It is non-transposing, being pitched in the key of C, the same as the Oboe. It is written in the treble clef, but actually sounds an octave lower; and in pitch relationship comes between the English Horn and Bassoon.

The tone is of exceptional beauty and richness, and vibrant in quality. It was first heard in "Salome" by Richard Strauss, who subsequently introduced it in several other works. Other modern composers have introduced it with telling effect, and while it has not been extensively provided for in orchestra scores as yet, it is only a question of time when it will be as commonly used as the English Horn, greatly adding to the effectiveness of the double reed group.

Its key mechanism is ingeniously contrived, making the hand positions and fingering practically the same as on the Oboe.

The range of the Heckelphone is:



CLARINET

ITALIAN	*GERMAN*	*FRENCH*
CLARINETTO	KLARINETTE	CLARINETTE

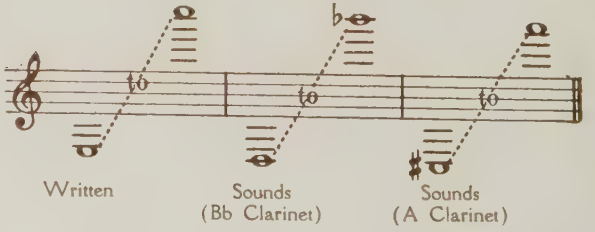
Unlike the Oboe, English Horn, and Bassoon, the Clarinet is of cylindrical bore, and is played with a mouthpiece to which is bound a single flat reed of cane. Clarinets have generally been made of hard wood or composition, but all metal instruments are now often preferred. Owing to its large range, variety of tone colors, facility of execution, and power of swelling and diminishing its tones, the Clarinet is generally conceded to be the most useful, as well as the most beautiful, of all the wood-wind instruments.

The Clarinet compass comprises four registers, which can be blended without perceptible break by the skillful performer. The first or lowest is dark and ominous. The second contsists of four or five dull, weak, notes of inferior quality. The third or medium register is of singular beauty, combining nobility, tenderness, and that limpid quality for which the clarinet is distinguished. The highest register is brilliant, but difficult to subdue, hence useful mainly in forte passages.

Clarinets are made in five or six different keys. All except the Clarinet in C are transposing instruments. In the modern Symphony Orchestra the two (or three) Clarinets are pitched in B flat or A. The former sounds one tone lower than written; the latter, in A, sounds a tone and a half lower than written. Compositions in sharp keys are usually scored for the A Clarinet; in flat keys for the B flat instrument.

The E flat Clarinets are mentioned in the Band Section.

The range of the Clarinet is:



Basset-Horn

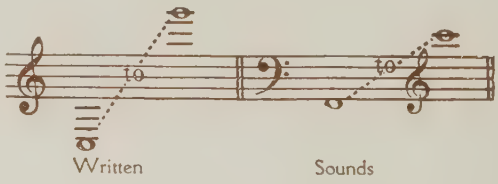
ITALIAN	*GERMAN*	*FRENCH*
CORNO DI BASSETTO	BASSETHORN	COR DE BASSET

The name Basset-Horn, like English Horn, is misleading. The instrument was invented in the year 1770 by a German clarinet maker by the name of Horn. He called his invention Basset-"Horn," which means "Little Bass (Clarinet made by) Horn." The Italians and French, unaware of this circumstance, translated the name "Horn" literally, hence the designations "Corno di Bassetto" and "Cor de Basset," both of which are misnomers.

The Basset-Horn is a tenor Clarinet in F provided with additional keys which extend its downward range to C instead of E, as in ordinary Clarinets. The bell joint is made of metal and is more flaring than that of other Clarinets. Owing to the wide bore of the instrument, the tone of the Basset-Horn is particularly rich and agreeably reedy.

Among the great composers, Mozart stands foremost in his appreciation and use of this beautiful instrument, having employed it in several of his operas, in Chamber Music, and in his Requiem. Since his time it has gradually fallen into disuse, for what reason it is difficult to conjecture, but on account of its fine tone and facility of execution it is again attracting the attention of serious orchestral composers. It is written in the treble clef as a transposing instrument in F, its tones sounding a fifth lower than its notation. The Alto Clarinet in E flat (described in the Band Section) is similar in appearance to the Basset-Horn and is used sometimes in the orchestra.

The range of the Basset-Horn is:



Bass Clarinet

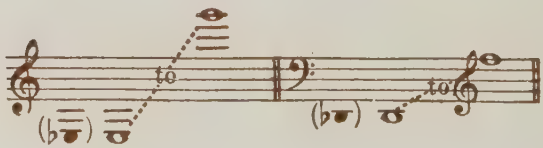
ITALIAN	*GERMAN*	*FRENCH*
CLARINETTO BASSO	BASS KLARINETTE	CLARINETTE BASSE

This instrument is pitched an octave lower than the ordinary Clarinet. Its peculiar form has been adopted for convenience in playing, and has no influence on its tonal quality, which (as in the case of the English Horn when compared with the Oboe) is similar to, though not identical with, that of the regular Clarinet.

It has neither the liquid quality in the medium, nor the menacing quality in the low register that distinguish the ordinary Clarinet, but its full, rich, organ-like tones form excellent basses for the wood-wind section, especially in sustained legato passages. In the execution of rapid staccato notes it cannot compete with the Bassoon. It is one of the most eloquent of solo voices, standing pre-eminent in the rendition of motives expressive of dignity and nobility.

Although the Bass Clarinet is made in A as well as in B flat, it has been found that, owing to its slowness of speech, no passages are likely to be written which require execution too rapid for convenient performance on the B flat instrument. One B flat Bass Clarinet is therefore all that is required in the Symphony Orchestra. It is sometimes provided with an extra key for low E flat. This gives the instrument the same downward range as the Bass Clarinet in A.

The range of the Bass Clarinet is:



(Extra) Written (Extra) Sounds

BASSOON

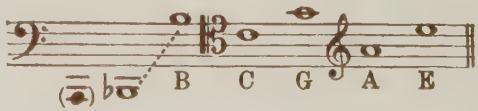
ITALIAN	*GERMAN*	*FRENCH*
FAGOTTO	FAGOTT	BASSON

The Bassoon is the natural bass of the oboe family. It is a double-reed instrument of conical bore with a tube about nine feet long, doubled upon itself for convenience of handling. It has an extreme compass of three and a half octaves, of which, however, the four or five highest notes are seldom used.

The tones of the lowest octave are full and rich and of ample power to form a foundation for the entire wood-wind section. The medium register is not especially resonant but is characterized by an agreeable dryness which is absolutely unique. Possessing neither the incisive bite of the Oboe nor the liquid beauty of the Clarinet, and with limited capability for swelling and diminishing the tone, the Bassoon rivals the Flute itself in the rendition of staccato passages. Thus employed, its dry croaking tones are irresistibly comic and are of great service to the composer in depicting the humorous or the grotesque when used in combination with Clarinets or Horns. The Bassoon is extremely valuable for supplying a harmonic middle to the orchestral mass. The high notes from E flat up to B flat are of singularly appealing beauty and have been called "Vox Humana Tones."

The Bassoon is a non-transposing instrument. The bass, tenor, and treble clefs are used in its notation. Symphony Orchestras usually require three players, the third of whom is also provided with a Contra-Bassoon to be used when required by the score.

The range of the Bassoon is:



Sometimes

Double Bassoon

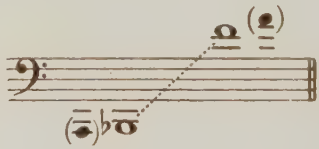
ITALIAN	*GERMAN*	*FRENCH*
CONTRAFAGOTTO	KONTRAFAGOTT	CONTREBASSON

This ponderous instrument, also called Contra Bassoon, is pitched an octave below the Bassoon, to which it bears the same relation as does the Double Bass to the Cello. It is usually about sixteen feet long, but is doubled on itself four times to make it less unwieldly. Although it has a possible range of three and a half octaves, its principal use is to extend the downward range of the Bassoon, thus supplying a solid, deep-pitched foundation for the wood-wind section.

The tones comprising the two lowest octaves are the most valuable. They are employed both in *forte* and *piano* passages, though the subduing of the deepest tones requires great skill. The soft attack is all but impossible. The tonal quality differs little from that of the ordinary Bassoon.

Although not a modern instrument, its use was long restricted, owing to imperfections in intonation. Recent improvements have made its use more general, and the third bassoonist of Symphony and Grand Opera Orchestras is always provided with a Double Bassoon to be used when required by the score. It is a transposing instrument in the same sense as in the Double Bass, notes being written a octave above their actual sound. Some Double Bassoons have an extra key for low A.

The range of the Double Bassoon is:
(Written notes.)



(Sounds an octave lower.)

SAXOPHONE

ITALIAN	*GERMAN*	*FRENCH*
SASSOPHONE	SAXOPHON	SAXOPHONE

This instrument was invented in the year 1840 by the eminent Belgian instrument-maker and inventor, Adolph Sax, from whom it derives its name. Its novelty consists in the use of the Clarinet single reed applied to a tube of extreme conical bore. The instrument thus combines important features of the Clarinet and the Oboe families -the single reed of the one with the taper bore of the other.

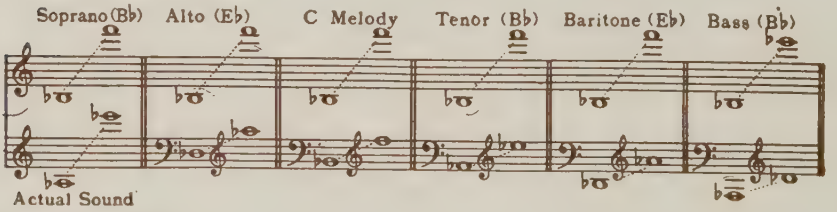
Th Saxophone is made of brass, frequently silver-plated, and comprises a family of seven different sizes, of which the most generally used are the soprano in B flat, alto in E flat, tenor in B flat, baritone in E flat, and bass in B flat. Of these five the soprano is the least pleasing and the alto and tenor the most. In recent years the C Melody Saxophone has become popular. The E flat Contra Bass will be mentioned in the Band Section. In quality of tone the Saxophone possesses the characteristic readiness of the Clarinet, to which, however, is added a certain brazen tinge, combined with a string quality akin to that of the Cello. The volume is greater, but the flexibility inferior to that of the Clarinet or the Bassoon.

Saxophones have been more extensively used in military bands than in the orchestra, though composers from about the middle of the last century, particularly the French, have occasionally introduced one or more Saxophones in operatic and other serious works.

Nowadays the Saxophone is not only a prominent feature in dance and popular music combinations but is being more and more used generally.

The playing range of all Saxophones is practically the same, and regardless of actual pitch sounds they are always written for in the treble clef, and with the exception of the C Melody are treated as transposing instruments in B flat or E flat.

The ranges and actual sound of the Saxophones most used are:



N. B.—The E flat Alto is shown in the illustration.

FRENCH HORN

ITALIAN	*GERMAN*	*FRENCH*
CORNO	HORN	COR

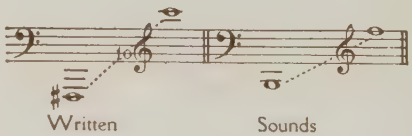
The original form of French Horn (Hand Horn, Waldhorn, Cor du Chasse, etc.) consisted of from nine to eighteen feet of coiled brass tubing, the precise length of which depended upon the key in which the horn was pitched. This instrument possessed very limited chromatic possibilities and it has become practically obsolete. In its place the modern valve horn in F is used almost exclusively. Its tube is about twelve feet long, and by virtue of its valve mechanism it can produce all chromatic tones within its range of three and one-half octaves. As in all brass instruments, the tone is produced by the vibration of the lips pressed against a mouthpiece, which in the case of the horn, is small and funnel-shaped rather than cupped.

The tone of the horn, except when forced and rendered "brassy" for the production of dramatic effects, is pure and noble. Its lovely, mellow tones blend as perfectly with the wood-wind as with the brass choir. The horn thus forms a connecting link between these two sections of the orchestra.

The horn is of inestimable value, both as a melody and as a harmony instrument. Its soft notes possess a remarkable pervading quality which is felt rather than heard, while a unison passage played *ff* by the four horns with which every symphony orchestra is provided, will cut through the entire orchestral mass.

The horn is probably the most difficult of all the wind instruments, and that it is the most treacherous is evidenced by the slips occasionally made by even the finest performers. The F horn is a transposing instrument. Both treble and bass clefs are used. F horn parts in the treble clef sound a fifth lower; in the bass clef, a fourth higher than written.

The range of the F Horn is:



(The five highest and the five lowest notes are difficult of production.)

TRUMPET

(VALVE TRUMPET)

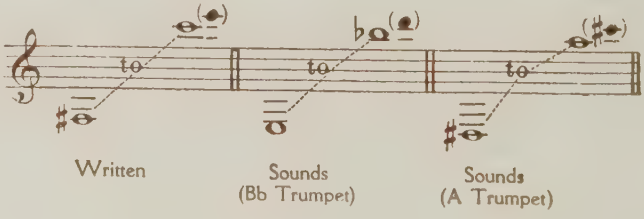
ITALIAN	*GERMAN*	*FRENCH*
TROMBA CLARINO	TROMPETE	TROMPETTE

The Trumpet is a brass instrument, the tube of which is one-half the length of that of the French Horn in the same key, and it therefore sounds an octave higher than the Horn. The modern orchestral trumpet is provided with the usual three valves, which give it a complete chromatic scale within its compass of about two and one-half octaves. The mouthpiece differs from that of the Horn in being cup-shaped rather than conical.

Although the older scores and indeed many modern ones call for trumpets in a variety of keys—C, D, E flat, F, etc., the Trumpets in B flat and A are used almost exclusively, the Trumpeters, like Hornists, transposing their parts at sight when transposition is necessary. These two instruments offer the same facility as B flat and A Clarinets for playing in flat and sharp keys. In the case of the Trumpet, however, only one instrument is necessary—that in B flat—as its pitch may be instantly lowered to A by drawing a telescopic slide or by employing a special valve mechanism.

The quality of tone of the Trumpet is brilliant, noble, and wonderfully penetrating in *ff*. Its softer accents are clear and pure, still retaining the characteristic nobility and incisiveness of the louder tones. Trumpets, like Cornets and Horns, may be muted by means of a pear-shaped device set in the bell. Two, and often three trumpets are required in a Symphony or Grand Opera Orchestra.

The range of the Trumpet is:



CORNET

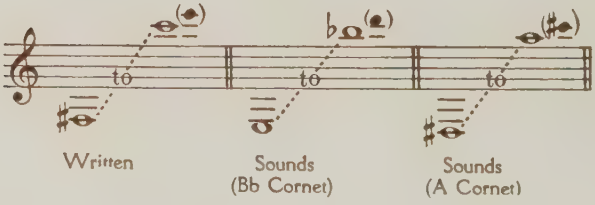
ITALIAN	*GERMAN*	*FRENCH*
CORNETTO CORNETTA	CORNETT	CORNET-À-PISTONS

This instrument is similar to the Valve Trumpet in all respects except that its bore is slightly conical instead of cylindrical. The mouthpiece also differs from that of the Trumpet in being less cup-shaped, thus tapering more gradually into the main bore of the instrument. These two features combine to render the tone of the Cornet coarser and thicker than the clear, brilliant tone of the Trumpet.

The Cornet is rare in the modern symphony orchestra, though it was of undoubted utility during the period prior to the introduction of Valve Trumpets. Two Cornets in addition to two Trumpets, were then employed, their special function being to supply the chromatic tones lacking on the plain Trumpet.

Owing to its ease of blowing and its pleasing, mellow tone, the Cornet is still much used in amateur and in small professional orchestras; also in military bands. It is made in B flat and is provided with a slide or a valve mechanism which instantly transforms it into an "A" instrument. In compass and in the manner of writing it is precisely like the Valve Trumpet. Cornets, like other similar brass instruments, may be muted by means of a pear-shaped device set in the bell.

The range of the Cornet is:



TROMBONE

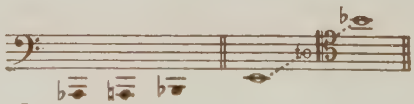
ITALIAN TROMBONE | *GERMAN* POSAUNE | *FRENCH* TROMBONE

This instrument differs radically from the other brasses in its possession of a free-running telescopic slide instead of valves. This slide enables the performer to adjust the speaking length of his instrument and its consequent pitch to a nicety. In fact, the precise manipulation of the slide of the Trombone is analogous to the correct location of the finger on the fingerboard of stringed instruments. There are also trombones with valves, but as they possess no advantage beyond mere facility of execution and are inferior in tone and precision, they are not used in first-class orchestras.

The tone of the Trombone is akin to that of the Trumpet—less brilliant but somewhat richer and fuller. This difference in tonal quality is due in part to the inner formation of the mouthpiece, which, though cup-shaped, is less shallow than that of the trumpet. Although the fortissimo of Trombones surpasses that of any other instrument, an exquisite pianissimo is also obtainable. The former is gorgeously majestic; the latter, mysteriously solemn. Thombones may be muted like Trumpets and Horns.

Of the three Trombones used in a Symphony Orchestra, all may be tenor instruments (in B Flat) or the lowest part may be played by a Bass Trombone (in G). The range of the latter is from low C sharp up to G, a minor third below that of the tenor instrument. All Trombones are treated as non-transposing instruments. Both the Tenor and Bass Clefs are used in the notation.

The range of the Tenor Trombone is:



Pedal Notes
(Seldom Used)

TUBA

ITALIAN	*GERMAN*	*FRENCH*
TUBA	TUBA	TUBA

The Tuba is the double bass of the brass section of the orchestra. It differs essentially from the Trumpet in that its tube is conical and not cylindrical—that is to say, it gradually widens from mouthpiece to bell. The Tuba is usually provided with four valves, the fourth of which gives the instrument an extended and valuable downward range.

Prior to its introduction into the orchestra by Wagner, the Tuba was used only in military bands. It is now a recognized member of the orchestral family, having entirely supplanted the Ophicleide, the deep-toned brass instrument formerly used.

Although Tubas are made in several different keys—F, E Flat, C and B Flat, they are invariably treated as non-transposing instruments when used in symphony or grand opera orchestras.

The tone-quality of the Tuba is full and organ-like in soft and medium passages. When played to the limit of its power it takes on a brilliancy and "snap" akin to that of the Trombone. It blends exceedingly well with the string basses, the effect of the combination being to impart to the very low tones a clarity and definiteness of pitch unattainable by any other means.

The range of the Tuba is:

CELESTA

This instrument was invented in 1886 by Mustel, of Paris, the eminent manufacturer of Harmoniums. It is a small keyboard instrument and consists of a series of steel plates suspended over accurately tuned wooden resonators. The plates are struck by small hammers and damped when the keys are released by an action similar to that of the pianoforte.

The tone of the Celesta is of exquisite purity. While lacking the power and the sparkling brilliancy of the Glockenspiel, it excels that instrument in mellowness and refinement of tone as well as in facility of execution.

Until comparatively recent times the Celesta was little used by other than French composers, though Tschaikowsky was early attracted to it and promptly introduced it into several of his ballets. Of late years, composers of all nations, notably Puccini and Richard Strauss, have included parts for this instrument in their orchestrations. The Celesta is especially effective in combination with Harps, supported by the soft chords in the woodwind. It is usually treated as a transposing instrument, the Celesta part being written an octave below the actual sound.

The range of the Celesta is:

The Dulcimer

HUNGARIAN	*ITALIAN*	*GERMAN*	*FRENCH*
C(Z)IMBALOM	CEMBALO	HACKBRETT	TYMPANON

This old instrument has been known in various lands and is said to be the precurser of the piano. Structurally it consists of a solidly constructed base or wrest plank, in which tuning pins to hold and tension metal or gut strings are inserted, and a sounding board topping the resonance chamber. The strings pass over bridges which demark their vibrating length.

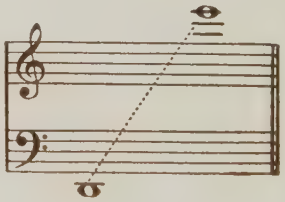
The smaller types of dulcimer could be placed on a table in performance. Hammers, one in each hand, are used to strike the strings, therefore it is classified as a percussion instrument. Somebody conceived the idea of operating the hammers through a mechanism controlled from a keyboard and in the course of time the piano was evolved.

The instrument today is made principally for use in Hungarian Gipsy orchestras, and in comparison with the earlier types is highly developed. In the first place it is larger and is supported on four legs after the fashion of the old square piano. The body is trapezium shaped: at the end nearest the performer it is about four feet eight inches wide, the sides proper slope inward reducing the width to about three feet two inches at the further end. Metal strings only are used.

Ordinarily dampers rest on the strings to prevent prolonged vibration, these dampers may be raised through the medium of a pedal when full vibration of chord or other consonant notes is desired.

Various types of music are played, melodies, rapid scale passages, tremolos and arpeggio figures. The latter may be so rapidly performed that they approximate chords, although actually only two tones can be simultaneously sounded. The tone is brilliant and there is much resonance, creating waves of sound in varying dynamics that are extremely effective in the warm emotional outbursts characteristics of Hungarian music. Players develop amazing technic on the instrument, very often improvising and adding a touch of spontaneity that colors the whole ensemble.

Music for the C(z)imbalom is written on two staves as for the piano, it has a chromatic range of about four octaves.



KETTLE-DRUMS

(TIMPANI)

ITALIAN	*GERMAN*	*FRENCH*
TIMPANI	PAUKEN	TIMBALES

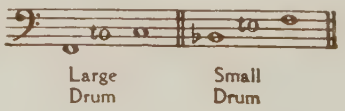
The Kettle-Drum consists of a hemispherical bowl of brass or copper, over which a parchment head is stretched. By varying the tension of the head by means of six or eight screws working on an iron ring, higher or lower tones of definite pitch are obtainable. Various mechanical means have been devised for changing the pitch of the drum by a single screw or lever (after equalizing the tension of the head by separate screws), and only the high cost of Drums so equipped has prevented their general adoption.

Timpani are played with two drumsticks, the heads of which are usually solid balls of felt. Such sticks produce a velvety, musical quality of tone not unlike that of the double bass pizzicato. For dramatic effects, where harshness and terrifying noise are the aim of the composer, the use of wood-headed sticks, sometimes covered with leather, is indicated.

Timpani possess an almost unlimited dynamic range from the faintest tap or rumble to a thunderous fortissimo. Detached notes are used for accentuating the rhythm, and the roll is invaluable for adding life and motion to sustained chords.

A pair of Timpani consists of a large and a small drum; three or more drums are employed with additional drummers on exceptional occasions. As the Timpanist must be prepared to vary the tuning of his drums during performance, he must possess a fine ear, if not, indeed, absolute pitch.*

The range of the Timpani, with all Chromatic Intervals, is:



* Recently Pedal Tympani have been quite widely adopted. These have the same ranges as the hand tuned tympani; but they vary their pitch very quickly through a foot-pedal mechanism. Even melodic passages are possible for them!

Bass Drum

ITALIAN	*GERMAN*	*FRENCH*
GRAN CASSA CASSA GRANDE Or simply CASSA	GROSSE TROMMEL	GROSSE CAISSE

This instrument gives a deep, booming sound of no definite pitch. It is played with a single, soft-headed drumstick with which tolerably close rolls are possible by the skillful performer. In loud passages its function is to augment the general volume of sound and especially to accentuate the rhythm. Struck softly it produces a dark, ominous effect which may be well employed in certain dramatic situations.

Snare Drum

ITALIAN	*GERMAN*	*FRENCH*
TAMBURO MILITARE	KLEINE TROMMEL	TAMBOUR (MILITAIRE) CAISSE CLAIRE

This small Drum derives its name from the thin strings of gut, called snares, which are stretched across its lower head. The peculiar rattling sound characteristic of this Drum is due to the vibration of these snares against the lower head when the upper head is beaten. The Snare Drum is played with two sticks of hardwood. The pitch is indefinite.

The technic of the Snare Drum is a difficult one to acquire, many years practice being required to produce a close, even roll. This is obtained not by rapid single strokes, but by the alternation of double strokes with each hand. The use of this drum in the orchestra is chiefly confined to the production of a military atmosphere.

CHIMES

ITALIAN	*GERMAN*	*FRENCH*
CAMPANE	GLOCKEN	CLOCHES

Orchestral Chimes consist of a series of accurately-tuned tubes of steel or bell-metal. They are graduated in size like organ pipes and are suspended from a suitable framework of wood. Their tone effectively simulates that of deep-pitched athedral Chimes and they serve in the orchestra to produce an atmosphere of solemnity, especially in music of a religious character. The tubes are struck near the upper end with a wooden mallet.

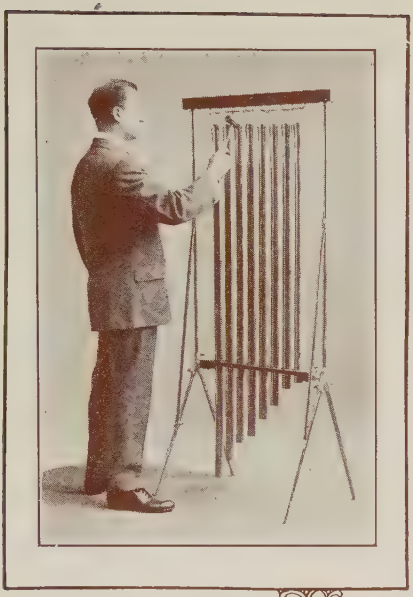
CYMBALS

ITALIAN	*GERMAN*	*FRENCH*
PIATTI	BECKEN	CYMBALES
CINELLI	CINELLEN	

A pair of Cymbals consists of two discs of resonant metal formed not unlike large dinner plates and about twelve inches in diameter. They are held by means of a loop of leather attached to the center of the instrument and passed around the hand of the performer. Cymbals are played, not by clashing them together, but by striking their edges with a sliding movement. Like other art instruments, cymbals may be of fine or of poor quality, producing a brilliant, lasting, and terrifying tone, or an impotent, dull smash, like broken crockery. The pitch is indefinite.*

From motives of economy, one of the Cymbals is often attached to the Bass Drum, the two instruments being played by the same performer. But as the Cymbals lose much of their characteristic clash by this treatment, it is not followed in first-class orchestras. One Cymbal is sometimes held in the hand and struck with the bass drumstick a single stroke or even a roll. Thus used the Cymbal takes on something of the character of the Gong. When short notes are required the tone is damped by quickly bringing the Cymbals against the chest.

* Smaller Cymbals (4 inches) made in definite pitches are used in oriental music and finger cymbals (1½ inches) are sometimes used by dancers.



GONG

ITALIAN	*GERMAN*	*FRENCH*
TAM-TAM	TAM-TAM	TAM-TAM

This instrument has come to us from China and is a round plate of hammered bronze with the edges turned up like a large Tambourine. It is struck with a soft, bass drumstick. Its effect in fortissimo is that of a terrible clangorous uproar which is of the utmost service to the composer when depicting scenes of horror. Struck more gently, or pianissimo, its effect varies between the solemn and the lugubrious. It is used mostly in connection with deep chords sustained by the brass instruments or by the lowest tones of Clarinets and Bassoons. It is an instrument without definite pitch.

TRIANGLE

ITALIAN	*GERMAN*	*FRENCH*
TRIANGOLO	TRIANGEL	TRIANGLE

This instrument, as its name implies, consists of a bar of steel bent in triangular form with one angle open. It is hung by a cord to a music stand or any suitable bracket and is struck with a small steel rod. It produces a bright, tinkling sound, without definite pitch, and is used to enhance light, fairy-like movements by marking the rhythm. The trill is of frequent occurrence and is executed by alternately striking two sides of the triangle.

CARL FISCHER

GLOCKENSPIEL

ITALIAN	*GERMAN*	*FRENCH*
CAMPANELLA	GLOCKENSPIEL	CARILLON JEU DE TIMBRE

The orchestral Glockenspiel consists of a series of from twenty-seven to thirty-seven graduated bars of steel, chromatically tuned, and mounted and played in similar manner to the Xylophone. Its possibilities of execution are the same as the Xylophone, but in the absence of any method of damping the tone, passages in too rapid tempo sound confused and are of poor effect. The clear, bell-like tones of this instrument are sparkling in their brilliancy and are of an incisive quality that penetrates the entire orchestra. A noteworthy use of the Glockenspiel by a great composer is in the last act of Wagner's "Meistersinger;" also in "Siegfried," and especially in the Magic Fire scene in "Die Walkure."

XYLOPHONE*

ITALIAN	*GERMAN*	*FRENCH*
XILOFONE	XYLOPHON STROHFIEDEL HOLZHARMONIKA	XYLOPHON CLAQUEBOIS

This is an instrument of great antiquity. It consists of twenty-seven (or a few more) hardwood blocks, graduated in length, mounted on taut cords, and all set in a suitable framework. The blocks are arranged in two rows, like the keys of a piano, and are accurately tuned. The instrument is played by striking with two light, flexible beaters of willow or boxwood.

The tone of the Xylophone is hard, dry, and rather hollow in quality. Very rapid passages, including trills, are possible by the skillful performer. Its use in the symphony orchestra is occasional and solely for the production of unusual—especially humorous effects.

---

* A recent invention is the Vibraphone, with wooden bars and metal resonators—like the Xylophone or Xylorimba, save that there are disc-like vibrators in the resonators that are actuated by electricity. A not unpleasant vibrato is thus imparted to the tone struck.

CARL FISCHER

Castanets

ITALIAN	*GERMAN*	*FRENCH*
CASTAGNETTE	KASTAGNETTEN	CASTAGNETTES

A pair of Castanets consists of two shell-like pieces of hardwood hinged together by a cord. The pair played by the left hand is usually the larger and is used to mark the main time. The smaller right hand pair executes embellishments on the main rhythm, some of which are extremely complicated in character. The Castanet is of Spanish origin, and is used in the orchestra to impart local color in compositions of a Spanish character. It produces a characteristic, dry click, without definite pitch

Tambourine

ITALIAN	*GERMAN*	*FRENCH*
TAMBURINO	BASKISCHE TROMMEL	TAMBOUR
	SCHELLEN	DE BASQUE
	TAMBOURIN	TAMBOURIN

This little instrument is said to have been in use practically unchanged for the past two thousand years. It consists of a small wooden hoop, on one side of which is stretched a parchment head, the other side being open. The hoop is cut away at intervals to allow the insertion of small pairs of metal plates called jingles. The head, when struck by the hand, gives forth a treble drum-like sound without definite pitch. The jingles may be trilled by shaking the instrument without striking the head. The use of the Tambourine in the orchestra is confined mainly to the production of oriental effects, though the jingles alone are sometimes employed in connection with other percussion instruments in music of a violent or barbaric nature.

VICTOR THEREMIN

With the advent of the radio, there has been born a new and strange electrical instrument called the "Theremin" (named after the inventor), which, in manner of playing and tone production, cannot be precisely classified under the existing symphonic or band instrumental choirs. It is included here because it has actually been used in symphonic programs, and composers of prominence have written especially for the Theremin. A quartet of these instruments played with the Philharmonic symphony orchestra of New York, and, later, a dozen of them were heard in an ensemble program at Carnegie Hall, New York. It has already been used on the programs of New York, Cleveland and Philadelphia symphony orchestras, and several other organizations are to use it in the near future. Joseph Schillinger, the Russian composer, wrote the first symphonic composition for this instrument, "The First Airphonic Suite," and has made many arrangements of standard works. Other composers who have contributed to the literature for the Teremin include, Alexander Siloti, Aric Abileah, and Robert Dussaut, the last being one of the modern French composers.

If you will glance at the picture on the opposite page, you will see that the right hand is held in free space near a vertical antenna, and the left hand near the horizontal loop antenna. The former, by approaching or receding the upright rod, respectively raises or lowers the pitch; and the left hand, by approaching or receding the loop antenna, respectively decreases or increases the volume (loudness) of the tone produced by the right hand. The instrument has a range of four octaves, with the fundamental varying with each different type of construction. The accompanying cut shows the standard type of instrument; but there are also other types which include so-called "finger board" models, by which existing orchestral instruments, like the Cello, are simulated.

The tone color of the Theremin resembles that of the stringed instruments—with the lower tones like that of the Cello, and the upper register like that of the violin. Some of the deepest tones sound very much like the low diapason stop on the pipe organ, and, as such, are very effective in symphonic or band ensembles. Of course the tone is a single one and sounds as long as the hands are in playing position.

Note: For a semi-electrical instrument, see Vibraphone, page Seventy-Two, foot-note.

FOREWORD ON THE BAND

WHILE the term Band may be used variously in connection with music, it is most commonly applied to large or small groups of wind instruments, with percussion added, vide: Brass Bands, Bands (ordinary), Military, Concert, and Symphony Bands.

¶ Bands naturally constitute the best medium for the presentation of music out-of-doors and in particular to inspire and lend hope and encouragement to men on the march, largely preventing fatigue and uniting all in a common bond of enthusiasm for some cause good, bad or indifferent. The power of music in this respect has been known and exploited the world over, from the earliest times.

¶ The Brass Band, as its name implies, is made up entirely of brass instruments with drums added. This is due to the fact that brass instruments seem to have been more available and popular, easier to play and generally more satisfying to the average beginner in music than the wood-wind instruments. Therefore in the past especially, brass bands of more or less complete instrumentation were the easiest to organize. Today this type of band, including its leading high pitch instrument, the Eb Cornet, has practically ceased to exist.

¶ The Band (ordinary) presupposes a more or less complete representation of wood-wind, brass and percussion instruments, and a membership of from twenty-five to fifty men, equipped for marching, when required. As the number of players is augmented, the largest percentage of increase is in the clarinet section; this is true of all bands.

¶ The Military Band is practically the same as the foregoing, except that it is generally made up to certain official specifications as to instrumentation and is often supplemented by a Fife, Drum or Bugle Corps. Among Military organizations must be mentioned the Cavalry (Mounted) Band, which, however, is practically limited to brass instruments for one hand manipulation while the other hand guides the mount. Small sized kettle-drums placed on either side of a well trained steed often lend a picturesque aspect.

¶ The Concert Band is the same as well equipped ordinary or military bands except that it generally includes String Basses, Timpani, Chimes and other instruments not carried on the march, and often a Harp.

¶ The Symphony Band (the term is of recent origin) is an ensemble built up to the fullest instrumentation possible in wind instruments, with String Basses, Harps and all percussion, with a membership of not less than sixty players. A special feature being a complete, self-supporting wood-wind choir, with particular attention to the clarinet section, where there may be sixteen or more Bb instruments and Eb Alto and Bass Clarinets as well. This mass in conjunction with the Oboes, Bassoons and one or more of the low pitched Sarrusophones can take over the string parts from orches-

tral scores with splendid effect. The instrumentation of the Symphony Band is being rapidly perfected, and will soon be as complete and standardized as that of the orchestra. The artistic possibilities of well-balanced bands should be more recognized and studied by our best composers, and then original band scores, comparable in inspiration and ingenuity to orchestra scores will be frequently heard. The imaginative, musicianly scoring of experienced band arrangers has in the meantime shown that a good band is a real medium for true musical expression.

PITCH OF INSTRUMENTS

Band music has traditionally been written in flat keys, possibly because the principal instruments, the brass, seem to have been most happy in the intonation of flat keys through the process of flattening open tones by tube extension (trombone slides, or valves). Various explanations might be given, but anyway with the exception of C Flutes, Oboes and Bassoons, all instruments ordinarily used in bands are pitched in flat keys, and the music is written in keys of from one to six flats, concert (that is, written notes and pitch sounds are identical, vide Piano or Violin).

The most radical difference in pitch between orchestra and band instruments is in the case of the Piccolo. Instruments of the flute family were originally most at home in sharp keys, so in order to do away with Piccolos having to play in flats, an instrument in Db was made. This permitted the Piccolo part being written principally in sharp keys, because the instrument being pitched half a tone above "C," concert pitch, necessitates a transposition a half tone lower in writing the Piccolo part. This, applied to the keys of F, Bb, Eb, Ab, etc., concert, results in the keys of E, A, D, G, comparatively easy for the Piccolo. For the same reason Flutes in Db were made, but this instrument was never used or written for to any great extent. Improvement in mechanism and fingering on modern flutes renders the C Flute adequate for all keys, but the Piccolo in Db seems to have become a fixture for band use.

A list from which the instrumentation (or instruments desired) may be selected, follows. All the instruments would seldom if ever be found in any one organization; many would be classed as substitutes.

Instruments Used in Bands

D flat Piccolo
C Flute
D flat Flute (rare)
B flat Fife*
E flat Clarinet
B flat Clarinet
E flat Alto Clarinet
B flat Bass Clarinet
Oboe
English Horn
Heckelphone
Bassoon
Contra Bassoon
E flat Contra Bass Sarrusophone
B flat Soprano Saxophone
E flat Alto Saxophone
C Melody Saxophone (substitute)
B flat Tenor Saxophone
E flat Baritone Saxophone
B flat Bass Saxophone
E flat Contra Bass Saxophone
B flat Cornet
B flat Trumpet
B flat Flugelhorn
G or F and B flat Bugles†

E flat Alto
E flat Horn
E flat Mellophone (Concert horn)
B flat Baritone
B flat Euphonium
B flat Tenor Horn
B flat Trombone
F Trombone (Bass)
B flat Bass
E flat Bass (Tuba)††
BB flat (Contra) Bass (Tuba)††
Double Bass (String)
Harp
Timpani
Snare-Drum
Bass Drum
Cymbals
Chimes
Bells and Marimbaphone
Lyre or Glockenspiel
Xylophone and Xylorimba
Tambourine
Castanets
Anvils and various Traps for special effects.

---

*The B flat Fife is used only on the Fife, Drum and Bugle Corps, (Field Music) independent organizations or in connection with Military Bands.

---

†Natural Trumpets or Bugles (without valves) used only in Fife, Drum and Bugle Corps.

---

††The E flat and BB flat Basses (Tubas) appear in the Helicon and Sousaphone form as well as the regular.

It will be seen from the foregoing list that most all woodwind, brass or percussion instruments previously mentioned as belonging to the orchestra are included in the modern symphony band. Apart from these the harp and double bass (string) are used in large concert bands, both being very effective and a valuable addition to the band ensemble. Before preceding to mention and illustrate any of the special band instruments, a few words will be given to those already spoken of where pitched differently for use in bands.

SPECIAL BAND TYPES (Pitches)
of Instruments Already Described

D FLAT PICCOLO

The D flat Piccolo as its name implies is pitched in D flat concert, a half tone higher than the ordinary C Piccolo used in the orchestra, with which in all other respects it is identical. The playing range is the same as that of the C Piccolo, the sounds being a minor ninth higher than written.

D FLAT FLUTE

The D flat Flute has been occasionally used for the same reasons that brought about the use of the D flat Piccolo. The range is the same as that of the C instrument, but the sound is a half tone higher. It is practically unrecognized today, however, by both arrangers and players, the C Flute having become the standard instrument.

B FLAT FIFE

The Fife is an instrument similar to the Flute, but rather shorter in length. The simple type has six finger holes only, others have from one to six keys in addition to the finger holes. A six keyed fife has a chromatic range of two octaves and a fifth. The tone quality is inclined to be loud and shrill, suitable only for the Fife and Drum Corps, "Field Music" in Army parlance. Fifes have been made in various pitches, but have not been well adapted for use with other wind instruments. In recent years the so-called "West Point" Model Fife in B flat has been largely adopted; this permits of the Fife and Drum Corps playing at times with the regular band. The custom is not general, but calls for the inclusion of the Fife among band instruments, although regular parts are never provided for it.

Range of Six Keyed Fife. (Chromatic)

Actual sounds according to pitch of instrument.

E FLAT CLARINET (HIGH)

The E flat Clarinet (high) is smaller and shorter in length than the B flat instrument but otherwise it is practically the same. The tone quality in the best registers is brilliant and well adapted to lend assistance to the Flute and Piccolo in topping the band ensemble above the comfortable range of the B flat Clarinets. It is not ordinarily treated as a solo instrument; the tone is not very sympathetic and is inclined to be shrill in the upper register. The playing range of the E flat Clarinet is theoretically the same as that of the other clarinets, but the highest notes are difficult to produce. The sound is a minor third higher than the written notes.

E FLAT ALTO CLARINET

The E flat Alto Clarinet is a very mellow, rich toned instrument, comparable in appearance to the Basset Horn (see Orchestral instrument section, page 31). Harmonically it fills in between the B flat Clarinets and the Bass Clarinet. It has the usual Clarinet range with the exception of the highest notes, that is, from E below the treble staff to the second G above, the actual pitch being a major sixth lower.

SAXOPHONES

The B flat Soprano, E flat Alto, B flat Tenor, E flat Baritone, B flat Bass and E flat Contra Bass are the instruments used in bands: they add a valuable tone color when allowed to sound as a separate choir. The size of the E flat Contra Bass, the deepest pitched of the family is strikingly shown in the illustration on the page following.

E FLAT HORN

The ordinary French Horn pitched in E flat instead of F, and playing from the E flat Alto (or Horn) parts in band music. Many players prefer to use the regular F instrument and transpose the notes one tone down. Horns have practically displaced Altos in concert bands.

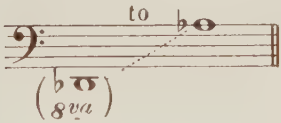
E FLAT CONTRA BASS SAXOPHONE*

This monster instrument is not as frequently seen as the smaller members of the family, but it will be found in many large bands, special saxophone bands and odd combinations. Despite the depth of its tones it is written for in the treble clef the same as are all other saxophones, the tones being actually pitched nearly three octaves lower.

The lower tones naturally speak slowly but the powerful tone is of great value in the foundation of the band ensemble.

The range of the E flat Contra Bass Saxophone is:

The actual sounds being two octaves and a major sixth lower.

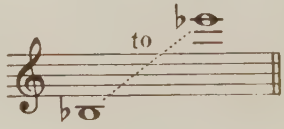


*NOTE:—Only the English name of the instrument is given here and on succeeding pages as the other languages call for but slight differences in spelling, if any.

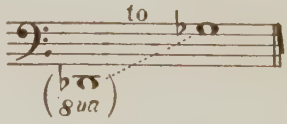
E flat Contra Bass Sarrusophone

Sarrusophones are so called after the inventor, Sarrus, a French band master who sought to increase the tonal volume of double reed instruments like the oboe and bassoon, by constructing them of brass instead of wood. The volume has been increased, but the tone is of rather penetrating, heavy quality. Sarrusophones have been made in many pitches from high to low, and constitute a family closely corresponding to the Saxophones, ranging from the high pitched Soprano in E flat down to the B flat Contra Bass; the only one used in American bands however being the E flat Contra Bass. This instrument assists materially in strengthening the bass parts, and in particular on account of its reedy quality of tone and technical facility can bring out string bass effects to advantage. Like the Saxophones the instruments are played from the treble clef, the playing range being practically the same as that of the Saxophones of like pitch.

The range of the E flat Contra Bass Sarrusophone is:



The actual sounds being two octaves and a major sixth lower.



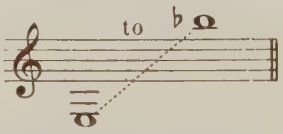
B FLAT FLUEGELHORN

A brass instrument of the Saxhorn type, resembling the Cornet in appearance, but of larger and more conical bore with flaring bell. It is not as useful all around as the Cornet, but the tone is of a peculiarly sweet, clear and beautiful quality and is a distinct addition to the band in solo or combination. It will be found in all European bands but has not come into general use in this country

The Fluegelhorn is sometimes used in symphony orchestras.

The range of the B flat Fluegelhorn is:

The sounds are one tone lower:



THE BUGLE*

The Bugle is likened to the Cornet except in that it has no valves. The tube of the original Bugle was doubled around several times, making the instrument handier for service use in Army and Navy. In recent years the short model has been supplemented by the longer Trumpet model as shown, so the modern military Bugle and Trumpet is one and the same instrument.*

Apart from company (military) buglers, Fife, Bugle and Drum Corps (Field Music) are regularly organized and while ordinarily playing independently, sometimes join in with the band on the march, special parts being printed or prepared. These instruments are also extensively used by Boy and Girl Scouts, military academies, etc. The Bugles and Trumpets most used are pitched in G with a tuning slide to F, and known as the regulation G and F Trumpet (or Bugle).

The B flat Bugle (large French model) also called the Clarion has of late been adopted by many of the leading regimental Drum Corps; this instrument being pitched the same as the regular Cornet and Trumpet, enables the Bugle Corps to play more readily with the band in the usual band keys, if not actually from Cornet and Trumpet parts.

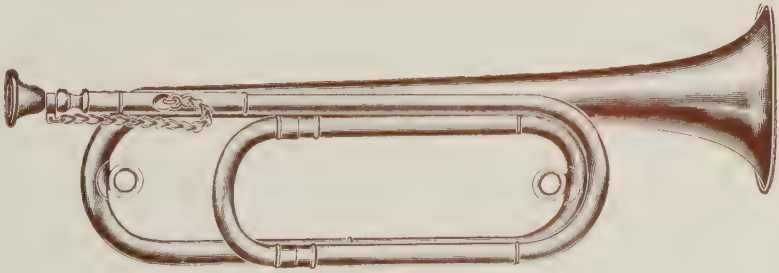
The Trumpet and Bugle without valves can only play tones belonging to the series of harmonics found in a sounding tube; that is, the so-called "open tones" playable on any brass instrument. On the five tones here given, all the signal calls used in the Army and Navy are based, being developed in varied melodic outline and rhythm.

*Sometimes called Trumpet in military service.

Average range and "Open Tones" as played:

Actual sounds according to pitch of instrument.

FLUEGELHORN



BUGLE

E FLAT ALTO
AND
MELLOPHONE
(OR CONCERT HORN)

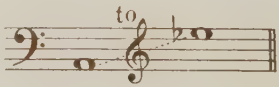
The E flat Alto belongs to the Saxhorn group of brass instruments. It is used for solo or harmony in the same manner as the Horn in the orchestra. The tone is inferior to that of the Horn but this lack is made up by the comparative security of intonation in general usage. There are several types of Altos, the familiar bell-up type, the bell front (like an overgrown Cornet) and the circular, known as the Mellophone (or Concert Horn). The latter instrument is used frequently in school or amateur orchestras, as well as in bands

MELLOPHONE
(OR CONCERT HORN)

E FLAT ALTO

The range of the E flat Alto, Mellophone, etc., is:

The sounds are a major sixth lower:



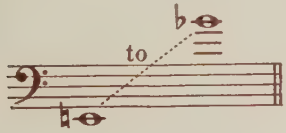
Baritone or Euphonium

The Baritone is a brass instrument belonging to the Saxhorn family and pitched in B flat, an octave below the B flat Cornet.

It possesses a full sonorous tone and practically the technical facility of the Cornet, making it invaluable as a solo or ensemble instrument in the band. The Baritone proper (three valves) operates exactly as does the Cornet, but sounds an octave lower.

The Euphonium is identical with the Baritone with the exception that it is provided with a fourth valve which extends the compass downward an augmented fourth. One type of Euphonium has an extra bell, smaller and less flaring than the regular bell. A special valve operates to divert the air column into this bell, which produces a tone of different quality, more like that of the trombone, where such a tone is desirable for solo or ensemble combinations.

The range of the B flat Baritone is



The range of the B flat Euphonium with four valves is extended downward to B flat below the staff.

BARITONE OR EUPHONIUM

Tenor Horn

The Tenor Horn is a brass instrument pitched in B flat and similar in appearance to the Baritone, except that, being of lighter build, it lacks the fullness of tone characteristic of the other instrument. Formerly sharing parts in common with Trombones it has been practically eliminated in favor of the latter instruments. The range is identical with that of the Baritone.

B flat Bass

The B flat Bass is in reality simply a Baritone built in larger bore which gives breadth and power to the tone, making it more suitable for the bass part proper. It is hardly used to the same extent as the E flat Bass (Tuba) or the Double B flat Bass (Tuba).

The range is the same as that of the Baritone.

Valve Trombone

The Valve Trombone is built on elongated lines similar to the regular trombone, but is provided with three valves, instead of a slide. It has never been a real rival of the slide instrument, the tone being of indifferent quality and somewhat unreliable as to intonation. But as it is comparatively easy to play it has found favor in some quarters, especially in small bands. The valve instrument in B flat (Tenor) has been most commonly used, but lower (Bass) and higher (Alto) pitched instruments have been available. The range of all trombones has been previously given; it may be added that the B flat Tenor Valve Trombone compares in range and technic to the B flat Baritone and Tenor Horn.

E flat Bass or Tuba

The Eb Bass is similar in appearance to the orchestral Tuba but is of somewhat lighter build. It plays the upper notes of the octave when so printed in band bass parts. It is pitched in E flat,, but is non-transposing, as are instruments of any pitch when reading from the bass clef, for reasons not necessary to explain here.

The range of the E flat Bass is written and sounds:

BB flat (Contra) Bass or Tuba

This is the largest and deepest toned brass instrument in use in the band, and is the real foundation of the ensemble. It is pitched in B flat, an octave below the Baritone. It is made with three or four valves, but the lowest (fourth valve) tones are of such profound depth and difficult production that they can only be introduced under the best possible conditions. It is practically a replica of orchestral Tuba.

The range of the BB (Contra) Bass is written and sounds:

HELICON, SOUSAPHONE

The Helicon is simply the E flat and BB flat (Contra) Bass constructed to encircle the body of the player for ease in carrying, particularly in mounted cavalry bands.

The Sousaphone, named after its originator John Philip Sousa, is a Helicon with widely flaring bell which may be adjusted to focus the tone in any direction. This instrument is a conspicuous feature of modern bands and dance orchestras,

SOUSAPHONE

SPECIAL BAND PERCUSSION INSTRUMENTS

There is no percussion instrument used in bands that has not been listed among the orchestral instruments. We will take the opportunity however, to mention that instruments of the metal bar and wooden bar types have been increased in size and greatly improved in tone, largely through the application of the resonator principle as found in the Marimba, an instrument native to northern South America and in a cruder form to Africa. They are called Marimbaphones (metal) or Xylorimbas (wood) but names vary according to makers. Some variety of these insturments will be found in concert bands, adding a valuable new tone color to the band ensemble, comparable in a way to that of the Celesta in the orchestra; since with two performers on the instrument, chord effects are possible in addition to the ordinary melodic passages.

See also foot-note, page seventy-two.

The Lyre or Glockenspiel, a set of steel bars mounted in a lyre-shaped frome at the top of a staff carried by the performer, is an attractive feature in marching bands.

LYRE

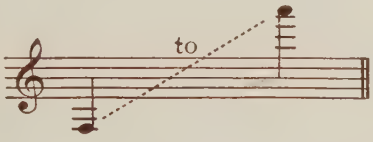
MARIMBAPHONE AND XYLORIMBA

PIANO-ACCORDION

GERMAN
ZIEH-HARMONIKA

FRENCH
ACCORDÉON

A free-reed instrument which takes a prominent place in the present-day modern dance orchestra. It is an improved and perfect type of the old-style accordion. Its body serves as a bellows and the closed portion at the right hand side is provided with a piano-keyboard which extends over a chromatic range of over three octaves:



The closed board at the left-hand side is furnished as a rule with six rows of buttons, two rows supplying the basses and the other four rows the chords (major, minor, dominant seventh and diminished seventh) conveniently placed for the fingers. The instrument is used either for solo or accompaniment playing.

08-DIH-654

PRINTED IN U. S. A.